State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Engineering Division
Honolulu, Hawaii 96813

January 25, 2008

Board of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii

Request for Authorization for the Department and Its Agents, Employees, and Consultants, to Enter Upon Various Private Properties and Easements / Right-of-Ways, for the Purpose of Conducting Investigations and Inspections of the Kaloko Dam, as Directed by Act 118, Session Laws of Hawaii 2006, Relating to Emergency Relief for Natural Disasters, and Pursuant to Hawaii Revised Statutes Chapter 179D.

Chapter 179D of the Hawaii Revised Statues (HRS) entitled the Dam and Reservoir Safety Act of 2007. The purpose of Chapter 179D is to provide for the inspection and regulation of construction, operation, and removal of certain dams and reservoirs in order to protect the health, safety, and welfare of the citizens of the State by reducing the risk of failure of such dams. Section 179D-6 HRS, empowers the Board of Land and Natural Resources, to enter upon private property of the dam or reservoir as may be necessary in making, at the owner's expense, any investigation or inspection authorized by chapter 179D. Similarly, section 179D-22, HRS, provides that the agents, employees, or authorized agents of the department may enter at reasonable times any property, public or private, for the purpose of investigating the condition, construction, or operation of any dam or reservoir;

The Governor issued an Emergency Proclamation on March 2, 2006, as amended by supplementary proclamations 1 through 7, as a result of heavy rainfall and flooding which caused wide spread damage including a dam failure, to provide relief for disaster damages, losses, and suffering, and to protect the health, safety, and welfare of the people. Within the 3rd Supplementary Proclamation, the Governor identified that "dangerous conditions of certain reservoirs in the State of Hawaii and erosion, and fear of dam failure in certain reservoirs constitute a public nuisance which are dangerous to the public health or safety or to property and hereby authorize the Director of Civil Defense or the Vice Director of Civil Defense to direct that any public nuisances be summarily abated, and if need be that the property be destroyed, by any police officer or any authorized person in order to protect the public health and safety", pursuant to Section 128-8(2) HRS. Additionally in the 4th Supplementary Proclamation the Governor directed "the Director of Civil Defense or the Vice Director of Civil Defense to continue all efforts and measures to complete the inspection of all reservoirs in the State in order to identify any reservoir that poses a danger to the public and take appropriate actions to protect the public health and safety."

Supporting these proclamations, the State Legislature passed Act 118, Session Laws of Hawaii (SLH) 2006 (amended by Act 89 SLH 2007), which appropriated funding to among other things, "hire consultants to conduct surveys, studies, and assessments of private and government-owned dams and reservoirs statewide to determine their current physical integrity. Assessments shall include recommendations for future structural needs and identification of potential effects or threats to areas around and downstream of the dams and reservoirs." The legislature declared that the appropriations under this act are in the public interest and for the public health, safety, and general welfare of the state.

In accordance with Act 118, the Department retained a consultant to conduct a Phase I or visual dam safety investigation of the partially failed Kaloko Dam. The Phase I dam safety investigation report was finalized in November 2007. This Phase I report concluded that "Although the Kaloko Reservoir dam appears to be stable at this time, a better knowledge of the dam structure is essential before a rational decision could be made about its stability and safety... It is our opinion that an additional in-depth study and discussions regarding the stability of the Kaloko Reservoir dam structure is necessary before any reasonable professional judgment can be made." Based on these conclusions, the Department has proceeded with plans to have the same consultant conduct an in-depth Phase II dam safety investigation study of the dam.

The Kaloko dam is located on land owned by Pflueger Partners. Part of the Kaloko reservoir is on land owned by Pflueger Partners; part is on land owned by the Mary Lucas Trust. Pflueger Partners and the Trust cooperated in providing access for the Phase I study. They have not agreed to do so in connection with the Phase II, apparently because they are concerned about how the Phase II may be used in on going litigation concerning the loss of life and property destruction caused by the dam's partial failure. The dam and reservoir are operated by Kilauea Irrigation Company, Inc. (KIC) under a Water Rights Agreement between it and the Trust. KIC also has certain rights and easements associated with Kaloko dam and reservoir.

The department has contracted with Earth Tech to perform the Phase II investigation. Earth Tech's December 6, 2007, letter discussing its need for access is attached to this submittal.

RECOMMENDATION:
That the Board of Land and Natural Resources approve the following:

1. Enforcement of the Board's and Department's rights as stated in Chapter 179D, to among other things, enter upon private property for the purposes of conducting surveys and investigations.
2. Authorize and direct the Department, its agents, and consultants to utilize physical means of opening locked or other blocked access ways to the dam as deemed necessary, should the owner fail to provide access. The landowners will be notified of the anticipated dates of entry and requested to facilitate access. These authorized physical means will be used only if necessary to gain access.
3. Authorize the Chairperson, with the assistance of the Department of Attorney General, to collect from the landowners the expense of conducting and preparing the Phase II investigation as deemed necessary.
4. Authorize the Chairperson to initiate penalties, fines or other charges in accordance with Chapter 179D, as deemed necessary.

Respectfully submitted,

ERIC T. HIRANO
Chief Engineer

Attachment

APPROVED FOR SUBMITTAL:

LAURA H. THIELEN, Chairperson

List of Attachments:

Attachment A - Land Ownership Map of Kaloko Reservoir Vicinity

Attachment B - Chapter 179D HRS – Dams and Reservoirs

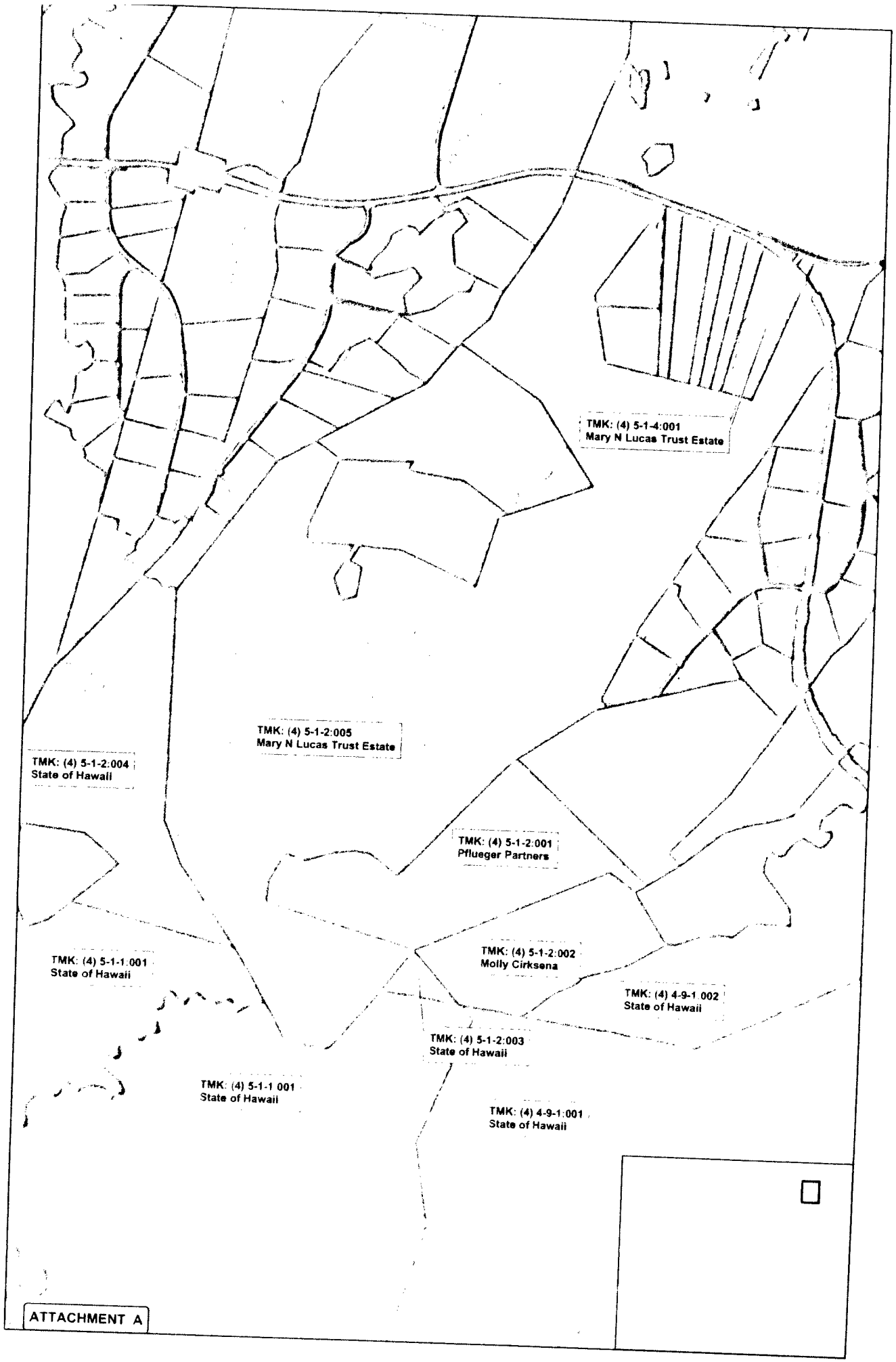
Attachment C - Excerpts from Preliminary Phase I Dam Safety Inspection Investigation of KaLoko Reservoir, A Post Breach Study, Kauai, Hawaii (Earth Tech, Inc., Nov 2007)

Attachment D - December 6, 2007 Earth Tech Kaloko Dam Access Request letter

Attachment E - 3rd Supplemental Proclamation from the March 2, 2006 Governor's Emergency Proclamation

Attachment A

Land Ownership Map of Kaloko Reservoir Vicinity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Mary N Lucas Trust Estate
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State of Hawaii
TMK: (4) 5-1-2:001
Pflueger Partners
TMK: (4) 5-1-1:001
State of Hawaii
TMK: (4) 5-1-2:002
Molly Cirksena
TMK: (4) 4-9-1 002
State of Hawaii
TMK: (4) 5-1-2:003
State of Hawaii
TMK: (4) 5-1-1 001
State of Hawaii
TMK: (4) 4-9-1:001
State of Hawaii
ATTACHMENT A

Attachment B

Chapter 179D HRS – Dams and Reservoirs

CHAPTER 179D
DAMS AND RESERVOIRS

Part I. General Provisions Section

Part II. Dam and Reservoir Safety

ATTACHMENT B

PART I. GENERAL PROVISIONS

Note: Sections 179D-1 to 179D-9 designated as Part I by L 2007, c 262, § 2.

§179D-1 Short title. This chapter shall be known and may be cited as the "Hawaii Dam and Reservoir Safety Act of 2007". [L 1987, c 199, pt of §1; am L 2007, c 262, §3]

§179D-2 Declaration of purpose. The purpose of this chapter is to provide for the inspection and regulation of construction, enlargement, repair, alteration, maintenance, operation, and removal of all dams or reservoirs to protect the health, safety, and welfare of the citizens of the State by reducing the risk of failure of the dams or reservoirs. The legislature finds and declares that the inspection and regulation of all dams or reservoirs are properly a matter of regulation under the police powers of the State, unless specifically exempted.

The board shall have jurisdiction of all dams and reservoirs until the department has completed its statewide inspections and has established and implemented rules and criteria for a five year dams and reservoirs inspection and classification processes and the board declares which dams or reservoirs are to be removed from its jurisdiction. [L 1987, c 199, pt of §1; am L 2007, c 262, §4]

§179D-3 Definitions. The following terms, whenever used and referred to in this chapter, shall have the following meanings, unless a different meaning clearly appears in the context:

"Application approval" means authorization in writing issued by the board to an owner who has applied to the board for permission to construct, enlarge, repair, alter, remove, maintain, or operate a dam or reservoir and that specifies the condition or limitations under which work is to be performed by the owner or under which approval is granted.

"Appurtenant works" or "appurtenance" means any structure, such as spillways in the dam or separate therefrom, the reservoir and its rim, low level outlet works, and water conduits, such as tunnels, pipelines, or penstocks, through the dam or its abutment.

"Board" means the board of land and natural resources.

"Certificate of approval to impound" means authorization in writing issued by the board to an owner of an existing dam or reservoir, or an owner who has completed construction, enlargement, repair, or alteration of a dam or reservoir, that specifies the conditions or limitations under which the dam or reservoir is to be maintained and operated.

"Dam" means any artificial barrier, including appurtenant works that impounds or diverts water and that:

(1) Is twenty-five feet or more in height from the natural bed of the stream or watercourse measured at the downstream toe of the barrier, or from the lowest elevation of the outside limit of the barrier if it is not across a stream channel or watercourse to a maximum water storage elevation;

(2) Has an impounding capacity at maximum water storage elevation of fifty acre-feet or more. This chapter shall not apply to any artificial barrier that is less than six feet in height regardless of storage capacity or that has a storage capacity at maximum water storage elevation less than fifteen acre-feet regardless of height; or

(3) Meets additional criteria or is specifically exempt as determined pursuant to rules adopted by the board.

"Department" means the department of land and natural resources.

"Emergency" includes but is not limited to breaches and all conditions leading to or causing a breach, overtopping, or any other condition in a dam or reservoir and its appurtenant works that may be construed as unsafe or threatening to life and property.

"Enlargement" means any change in or addition to an existing dam or reservoir that raises or may raise the water storage elevation of the water impounded by the dam or reservoir.

"Hazard potential" means the possible adverse incremental consequences that result from the release of water or stored contents due to the failure of the dam or reservoir or the misoperation of the dam, reservoir, or appurtenances. The hazard potential classification of a dam or reservoir shall not reflect in any way on the current condition of the dam or reservoir and its appurtenant works, including the dam's or reservoir's safety, structural integrity, or flood routing capacity.

"High hazard" means a dam's or reservoir's failure will result in probable loss of human life.

"Low hazard" means a dam's or reservoir's failure will result in no probable loss of human life and low economic loss or environmental loss, or both. Economic losses are principally limited to the owner's property.

"Operator" means any person who controls, manages, maintains, or supervises the condition and functions of a dam or reservoir.

"Owner" means any person who has a right, title, or interest in or to the dam or reservoir or to the property upon which the dam, reservoir, or appurtenant works is located or proposed to be located.

"Person" means any natural person, partnership, firm, association, organization, corporation, county, county authority, trust, receiver or trustee, limited liability company, limited liability partnership, or company, or any state department, agency, or political subdivision, or any other commercial or legal entity. Whenever used in a section prescribing and imposing a penalty or sanction, the term "person" includes the members of an association or organization, and the officers of a corporation, company, county, or county authority.

"Physical clear access" means a roadway or path that allows timely access for inspection to a dam, reservoir, and its appurtenant works. If by a roadway, the roadway shall be maintained in an accessible condition by a four-wheel drive vehicle even during inclement weather conditions.

"Probable" means more likely than not to occur; reasonably expected; realistic.

"Removal" means complete or partial elimination of the dam or reservoir embankment or structure to restore the approximate original topographic contours of the valley.

"Reservoir" means any basin that contains or will contain water impounded by a dam, including appurtenant works.

"Significant hazard" means a dam's or reservoir's failure will result in no probable loss of human life but can cause major economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams or reservoirs are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure. [L 1987, c 199, pt of §1; am L 2007, c 262, §5]

§179D-4 Liability for damages.

(a) Nothing contained in this chapter shall be construed to constitute a waiver of any immunity of the State and no action or failure to act under this chapter shall be construed to create any liability in the State, board, department, or its officers or employees, for the recovery of damages caused by the action or failure to act.

(b) Nothing in this chapter and no order, action, or advice of the State, board, department, or any representative thereof, shall be construed to relieve an owner or operator of a dam or reservoir of the legal duties, obligations, or liabilities incident to the ownership or operation of a dam or reservoir; provided that an owner or operator of a dam or reservoir shall not be liable for damages as a result of only natural causes such as earthquakes of an average recurrence interval of one thousand years, hurricanes, or extraordinary rains of an average recurrence interval in excess of two hundred fifty years.

(c) The State assumes no ownership obligations, responsibilities, or liability for any action pursuant to section 179D-24. [L 1987, c 199, pt of §1; am L 2007, c 262, §6]

§179D-5 REPEALED. L 2007, c 262, §11.

§179D-6 General powers and duties of the board of land and natural resources.

(a) All dams or reservoirs in the State shall be under the jurisdiction of the board until the board declares which dams or reservoirs are to be removed from its jurisdiction.

(b) The board shall administer the dam and reservoir safety program established by this chapter. In carrying out this chapter, the board shall cooperate, advise, consult, contract, and enter into cooperative agreements with the United States government or any of its agencies, other state agencies, and the county governments or any of their agencies. In the performance of its duties, the board shall:

(1) Establish by rules adopted under chapter 91, policies, requirements, or standards governing the design, construction, operation, maintenance, enlargement, alteration, repair, removal, and inspection of dams, reservoirs, and appurtenant works for the protection of life and property from structural failure of dams and reservoirs;

(2) Conduct investigations and the collection of data, including technological advances made in dam and reservoir safety practices elsewhere, as may be needed for the proper review and study of the various features of the design, construction, repair, removal, inspection, operation, maintenance, alteration, and enlargement of dams, reservoirs, and appurtenant works. The board may require submittal of reports of investigations from all owners;

(3) Conduct investigations and require reports from all owners to be made from time to time, including watershed investigations and studies, as may be necessary to keep abreast of developments affecting stream runoff and as required to facilitate its decisions;

(4) Be authorized to enter upon such private property of the dam or reservoir as may be necessary in making, at the owner's expense, any investigation or inspection required or authorized by this chapter. The entry shall not constitute a cause of action in favor of the owner of the land, except for damages resulting from wilful acts or negligence by the board or its agents;

(5) Require the owners to apply for, and obtain from the board written approval of plans and specifications on the construction of any new dam or reservoir or the enlargement of any dam or reservoir prior to commencement of any work;

(6) Require the owners to file an application and secure the written approval of the board before commencing the repair, alteration, or removal of a dam or reservoir, including the alteration or removal of a dam or reservoir so that it no longer constitutes a dam or reservoir as defined in this chapter. Repairs shall not be deemed to apply to routine maintenance not affecting the safety of the structure;

(7) Require owners to secure the written approval of the board to impound water;

(8) Require fees to cover the board's costs in carrying out the administration of dam and reservoir safety;

(9) Cooperate with all public and private agencies created for the purpose of enhancing dam and reservoir safety activities and training, assist these organizations and agencies in coordinating the use of their facilities, and participate in the exchange of ideas, knowledge, and data with these organizations and agencies;

(10) Prepare, publish, and issue printed pamphlets, bulletins, or advisories, or conduct training as the board deems necessary for the dissemination of information to the public;

(11) Appoint and remove agents and employees, including hearing officers, specialists, and consultants, as necessary to carry out the purposes of this chapter, who may be engaged by the board without regard to the requirements of chapter 76;

(12) Catalog and maintain an inventory of all regulated dams and reservoirs in the State pursuant to this chapter without regard to chapter 91;

(13) Establish similar or consistent hazard potential classifications in conjunction with other applicable state or federal guidelines for all regulated dams and reservoirs in the State pursuant to this chapter without regard to chapter 91;

(14) Examine and approve or disapprove applications for approval of construction, enlargement, repair, alteration, or removal of a dam or reservoir and applications for certificates of approval to impound;

(15) Order the suspension, revocation, or both, of any application approval or certificate of approval to impound for any act or failure to comply with this chapter or with any rules or orders adopted pursuant to this chapter, or with any of the conditions contained in or attached to the application approval or certificate of approval to impound;

(16) Issue orders requiring the adoption by an owner of remedial measures necessary for the safety of life or public or private property, or for carrying out this chapter or rules issued under this chapter;

(17) Order the immediate cessation of any act that is started or continued without an application approval or certificate of approval to impound as required by this chapter;

(18) Enter private property and immediately take actions necessary to provide protection to life or property at the owner's expense, including removal of the dam or reservoir. The entry shall not constitute a cause of action in favor of the owner of the land, except for damages resulting from wilful acts or gross negligence by the board or its agents;

(19) Recover from the owner, in the name of the State, the expenses incurred in taking any action required by the owner of the dam or reservoir in the same manner debts are recoverable by law;

(20) Assess civil penalties for violation of this chapter or any rule or standard adopted or order issued by the board pursuant to this chapter;

(21) Place liens, as needed, on the owner's property, to be collected as delinquent taxes against the lands and property, if the owner neglects to pay any costs, expenses, or penalties chargeable to the owner under this chapter or any rule, order, or condition adopted, issued, or required under this chapter;

(22) With the assistance of the attorney general, institute and prosecute all court actions that may be necessary to obtain the enforcement of any order issued by the board in carrying out this chapter; and

(23) Take any and all other actions as may be necessary to carry out this chapter. [L 1987, c 199, pt of §1; am L 2007, c 262, §7]

§179D-7 Administrative and judicial review.

(a) The findings and order of the board, and the board's approval or disapproval of an application issued by the State are final, conclusive, and binding upon all owners, state agencies, and other government agencies, regulatory or otherwise, as to the safety of design, construction, enlargement, repair, alteration, removal, maintenance, and operation of any dam or reservoir. The board's approval of an application or a certificate of approval to impound shall not be considered final if it can be demonstrated to the board that the board's approval of the relevant application or certificate of approval was based on one or more misrepresentations.

(b) Any person who is aggrieved or adversely affected by an order or action of the board shall be entitled to administrative and judicial review in accordance with chapter 91; provided that the order or action shall remain in force until modified or set aside on appeal. [L 1987, c 199, pt of §1; am L 2007, c 262, §8]

§179D-8 Violations; penalties.

(a) Except as otherwise provided by law, the board may set, charge, and collect administrative penalties and recover administrative fees and costs, including attorney's fees and costs, or bring legal action to recover administrative penalties, fees, and costs, including attorney's fees and costs, or payment for damages or for the cost to correct damages resulting from a violation of this chapter or any rule, order, or condition adopted, issued, or required under this chapter. The administrative penalty shall not exceed $25,000 per day of a violation, and each day during which the violation continues shall constitute an additional, separate, and distinct violation. The board shall effectuate rules, procedures, and fee schedules to carry out the purposes of this section.

(b) Any person who negligently or after written notice to comply, violates this chapter or any rule, order, or condition adopted, issued, or required under this chapter, or knowingly obstructs, hinders, or prevents the department's agents or employees from performing duties under this chapter, shall be guilty of a class C felony, and upon conviction thereof, shall be punished as follows:
(1) For a first conviction, by a mandatory fine of not less than $2,500 but not more than $25,000 per day of violation, imprisonment, or both; and
(2) For a second or subsequent conviction, by a mandatory fine of not less than $5,000 but not more than $50,000 per day of violation, imprisonment, or both.

(c) Any criminal action against a person for any violation of this chapter shall not preclude the State from pursuing civil legal action to recover administrative penalties, fees, and costs against that person. Any civil action against a person to recover administrative penalties, fees, and costs for any violation of this chapter or any rule, order, or condition adopted, issued, or required under this chapter shall not preclude the State from pursuing any criminal action against that person.
(d) With the assistance of the attorney general, the board may seek an injunction and damages in the enforcement of this chapter.
(e) All penalties, fees, and costs collected pursuant to this section or rules adopted by the board pursuant to this chapter, shall be deposited in the dam and reservoir safety special fund. [L 1987, c 199, pt of §1; am L 2007, c 262, §9]

§179D-9 Enactment of rules. The department shall adopt the necessary rules not later than one and one-half years after July 1, 2007. [L 1987, c 199, pt of §1; am L 2007, c 262, §10]

[PART II.] DAM AND RESERVOIR SAFETY

[§179D-21] Certificate of approval to impound. No owner of a dam or reservoir shall impound water without a valid certificate of approval to impound water at the dam or reservoir. [L 2007, c 262, pt of §1]

[§179D-22] Entry upon property.

(a) The department shall have the right to direct and conduct investigations as it may reasonably deem necessary to carry out its duties as prescribed in this part. For this purpose, the agents or employees of the department or any authorized representatives may enter at reasonable times, without prior notice, any property, public or private, for the purpose of investigating the condition, construction, or operation of any dam, reservoir, or other artificial barrier dealt with in this chapter; provided that if an emergency situation arises as determined by the department, the agents or employees of the department, or any authorized representatives shall have the right to enter without prior notice, any property, public or private, for the purpose of investigating the condition, construction, or operation of any dam, reservoir, or other artificial barrier subject to this chapter, and to take any remedial actions, without a search warrant or liability for trespass.

(b) It shall be unlawful for any person to refuse entry or access to any authorized representative of the department who requests entry for purposes of inspection and who presents appropriate credentials. It shall also be unlawful to obstruct, hamper, or interfere with any representative while in the process of carrying out the representative's official duties.

(c) Notwithstanding any other provision of law to the contrary, the board and its agents, engineers, and other employees, for the purposes of enforcing this chapter, may enter upon any land or water in the State that is the subject of an inspection, investigation, or remedial actions without a search warrant or liability for trespass. [L 2007, c 262, pt of §1]

[§179D-23] Injunctive relief. Whenever in the judgment of the department any person has engaged in or is about to engage in any act or practice that constitutes or will constitute an unlawful action under this chapter, the department may apply to the circuit court of the county in which the unlawful act or practice has been or is about to be engaged in, or in which jurisdiction is appropriate, for an order enjoining the act or practice, or for an order requiring compliance with this chapter. Upon a showing by the department that a person has engaged in or is about to engage in any unlawful act or practice, a permanent or temporary injunction, restraining order, or other order shall be granted without the necessity of showing lack of an adequate remedy at law. [L 2007, c 262, pt of §1]

[§179D-24] Emergency actions.

(a) If, in the opinion of the department, conditions of any dam or reservoir are so dangerous to the health and safety of life or property as to not permit time for issuance and enforcement of an order relative to construction, modification, maintenance, or repair of the dam or reservoir, or the dam or reservoir is threatened by any large flood or other natural disaster, the department may immediately employ remedial measures necessary to protect life and property.

(b) The department shall provide coordination and assistance to the proper state or county agency or agencies to maintain control of any dam or reservoir that, pursuant to subsection (a), has been determined to be dangerous to life or property until the dam or reservoir is deemed safe, or until any emergency conditions that precipitated taking control of the dam

or reservoir, pursuant to subsection (a), have been abated. The department may determine the proper time at which to relinquish control of the dam or reservoir.

(c) Any necessary and reasonable costs and expenses incurred by the department in fulfilling the duties mandated by subsections (a) and (b) in connection with a remedial or emergency action shall be recoverable by the department from the owner of any dangerous or threatened dam or reservoir.

(d) Any owner failing or refusing, after written notice has been given, to pay the reasonable costs and expenses incurred by the department pursuant to subsection (c) shall be, upon complaint by the department to the attorney general, subject to reasonable attorney fees incurred in the recovery of the costs and expenses.

(e) All moneys collected by the department pursuant to subsection (c) shall be credited to the dam and reservoir safety special fund created in section 179D-25.

(f) If a condition arises that in the opinion of the department may pose a danger to the health and safety of persons or property and sufficient time permits, the board may issue orders reciting the existence of the condition and require any actions the board deems necessary. Any person to whom an order is directed, may challenge the order, but shall immediately comply with the order, pending disposition of the person's challenge. The board shall give precedence to a hearing on the challenge over all other pending matters.

(g) The legislature finds and declares that emergency actions under this section are in the public interest and for the public health, safety, and general welfare of the State, and authorizes the board to take any necessary actions. [L 2007, c 262, pt of §1]

[§179D-25] Establishment of dam and reservoir safety special fund.

(a) There is established in the department a special fund, to be designated the dam and reservoir safety special fund. The fund shall be administered by the board. The following shall be deposited into the dam and reservoir safety special fund:
  (1) Appropriations by the legislature;
  (2) All fees and administrative charges collected under this chapter or any rule adopted thereunder;
  (3) Moneys collected as fines or penalties imposed under this chapter or any rule adopted thereunder;
  (4) Moneys derived from public or private sources to benefit dam and reservoir safety;
  (5) Moneys collected in full or partial satisfaction of liens created under this chapter;
  (6) Any moneys collected from the sale of retail items by the department relating to dam and reservoir safety;
  (7) Any other moneys collected pursuant to this chapter or any rules adopted thereunder; and
  (8) Moneys derived from interest, dividends, or other income from other sources.

(b) The board may expend moneys from the dam and reservoir safety special fund for:
  (1) Conducting investigations, research, and the collection of data, including technological advances made in dam and reservoir safety practices elsewhere;
  (2) Conducting investigations, monitoring, and inspection programs and activities, and enforcement;
  (3) Preparing and disseminating information to the public concerning activities authorized under this chapter;
  (4) Training and providing educational activities for department staff and dam and reservoir owners;
  (5) Employing any necessary remedial measures to protect persons and property in accordance with this chapter;
  (6) The costs and expenses of the coordination, assistance, control, regulation, abatement, and inspection provided by this chapter; and

(7) Other purposes for the administration of the dam and reservoir safety program under this chapter or any rule adopted thereunder, including but not limited to funding permanent or temporary positions that may be appointed without regard to chapter 76.

The board shall provide coordination and assistance to the proper state or county agency or agencies to control any dam, reservoir, and appurtenances subject to section 179D-24 until they have been rendered safe or the emergency has terminated.

(c) Moneys on balance in the dam and reservoir safety special fund at the close of each fiscal year shall remain in that fund and shall not be transferred or lapsed to the credit of the general fund. [L 2007, c 262, pt of §1]

[§179D-26] Liens.

(a) Costs of construction, enlargement, repair, alteration, or removal work done to render a dam, reservoir, or appurtenances safe shall constitute a statutory lien against all property of the owner. Notwithstanding any other law to the contrary, the lien shall be considered prior and superior to all other mortgages, liens, or encumbrances of record even if those other mortgages, liens, or encumbrances were filed before the lien pursuant to this subsection becomes due.

(b) Liens pursuant to subsection (a) may be perfected and foreclosed in advance of construction, enlargement, repair, alteration, or removal or after completion of the construction, enlargement, repair, alteration, or removal. If perfected in advance, the lien shall be perfected by the filing of an affidavit of the board setting forth the estimate of the costs of construction, enlargement, repair, alteration, or removal within the county in which the dam or reservoir is located in the same manner as prescribed for mechanic's liens. When the affidavit is filed, the amount set forth in the affidavit shall be a lien in that amount against all property of the owner. If the actual cost of construction, enlargement, repair, alteration, or removal exceeds the estimated cost, the board may amend the affidavit setting forth the additional estimated cost. If the estimated cost exceeds the actual costs of construction, enlargement, repair, alteration, or removal at completion, the board shall file an amended affidavit at completion. If a lien is perfected in advance and the construction, enlargement, repair, alteration, or removal is not commenced within two years from the date of perfection, the lien shall be void. The board shall file a satisfaction of lien upon payment of the costs of construction, enlargement, repair, alteration, or removal by the owner. [L 2007, c 262, pt of § 1]

[§179D-27] Dams and reservoirs completed prior to July 6, 2007.

(a) Every owner of a dam or reservoir that falls within the definition of a dam or reservoir in this chapter and was completed prior to July 6, 2007 shall file with the board a separate application for a certificate of approval to impound and any other supporting information as required by the board for each dam or reservoir. Each application shall also be accompanied by application fees as required by the board. During the application process for a certificate of approval to impound, the owner or operator of a dam or reservoir may continue to impound water, unless the board determines that the dam or reservoir may pose a danger to the health and safety of persons or property.

(b) The board shall give notice to file an application for certificate of approval to impound to owners of dams or reservoirs who have failed to file such applications as required by this chapter.

(c) The notice provided for in this section shall be delivered by certified mail to the owner at the owner's last address of record in the office of the county tax assessor in which the dam or reservoir is located. The mailing shall constitute service.

(d) The board shall make inspections of any dams and reservoirs, unless the data, records, and inspection reports on file with it are found adequate to enable a determination of whether or not the certificate of approval to impound should be issued.

(e) The board shall require owners of the dams and reservoirs to perform at their expense any work or tests as may reasonably be required to disclose information sufficient to enable the board to determine whether to issue certificates of approval to impound, or to issue orders directing further work at the owner's expense necessary to safeguard life and property. For this purpose, the board may require an owner or operator to lower the water level of, or to drain, the dam or reservoir.

(f) If, upon inspection or upon completion to the satisfaction of the board of all work that may be ordered, the board finds that the dam and reservoir are safe to impound water, a certificate of approval to impound shall be issued. The board may find that the dam or reservoir will not safely impound water and may refuse to issue a certificate of approval to impound. Upon finding that the dam or reservoir is unsafe to impound water, the board shall issue a written notice to the owner. After receipt of the notice, the owner shall no longer cause or allow the dam and reservoir to impound water. [L 2007, c 262, pt of §1]

Revision Note: "July 6, 2007" substituted for "effective date of this Act" and "the effective date of this Act" respectively.

[§179D-28] Dams and reservoirs under construction, enlargement, repair, alteration, or removal before July 6, 2007.

(a) Any dam or reservoir that falls within the definitions of a dam or reservoir in this chapter and which the board finds was under construction, enlargement, repair, alteration, or removal, and based on its findings not more than ninety per cent constructed, enlarged, repaired, altered, or removed on July 6, 2007, except as provided in subsection (b), shall be subject to the same provisions in this section as a dam or reservoir commenced after that date. Every owner of a dam or reservoir subject to this section shall file an application with the board for the board's written application approval of the plans and specifications for the dam or reservoir.

(b) Construction, enlargement, repair, alteration, or removal work on the dam or reservoir may proceed; provided an application for approval of the plans and specifications is filed; until:
(1) An application approval is received by the owner approving the dam or reservoir; or
(2) An order is received by the owner specifying how the construction, enlargement, repair, alteration, or removal must be performed to render the dam or reservoir safe.

After receipt of an application approval or order specifying how construction, enlargement, repair, alteration, or removal of the dam or reservoir must be performed, work thereafter must be in accordance with the application approval or order. [L 2007, c 262, pt of §1]

Revision Note: "July 6, 2007" substituted for "effective date of this Act" and "the effective date of this Act" respectively.

[§179D-29] Annual report. The department shall submit an annual report to the governor and the legislature by January 5 of each year concerning the activities of the department relating to this chapter for the preceding fiscal year. The report shall include but not be limited to information on the following:

(1) Approvals of plans and specifications for the construction of dams and reservoirs and for alterations, modifications, repairs, removal, and enlargements of any dams and reservoirs;

(2) A listing of dam and reservoir safety inspections made;

(3) Use of appropriated funds;
(4) Rules adopted or amended;
(5) Enforcement orders and proceedings;
(6) Dam and reservoir failures and department evaluations of the reasons for the failure, if known; and
(7) Any other available data regarding the effectiveness of the State's dam and reservoir safety program. [L 2007, c 262, pt of §1]

[§179D-30] Dam and reservoir owners; general requirements and responsibilities. Dam and reservoir owners subject to regulation under this chapter shall, among other general requirements and responsibilities:

(1) Maintain an operation and maintenance plan, including an owner or operator, as the case may be, inspection and monitoring program, with written, regularly scheduled reports to the board, to maintain and keep the structure, its appurtenant works, and access in the state of repair and operating condition required by the exercise of due care, with regard for the safety of persons or property, sound and accepted engineering principles, and the rules adopted by the board;
(2) Establish an emergency action plan for high and significant hazard potential dams and reservoirs and provide this plan to the board, state and county civil defense agencies, and other necessary parties, with regard for the safety of persons or property, sound and accepted engineering principles, and the rules adopted by the board;
(3) Cooperate with the board's agents, engineers, and employees in carrying out this chapter;
(4) Facilitate access by any necessary state agencies or authorized representative, to the dam, reservoir, or appurtenances. Access by a four-wheeled-drive vehicle to the dam or reservoir site, and appurtenances if required by the board, shall be maintained at all times; provided that if vehicular access to the dam or reservoir site cannot be maintained during periods of inclement weather, the dam or reservoir owner for high and significant hazard potential dams or reservoirs shall have redundant early warning systems in place, as approved by the board; and
(5) Furnish upon request the plans, specifications, operating and maintenance data, or other information that is pertinent to the dam and reservoir structure and appurtenances as indicated in this chapter. [L 2007, c 262, pt of §1]

Attachment C

Excerpts from Preliminary Phase I Dam Safety Inspection Investigation of KaLoko Reservoir, A Post Breach Study, Kauai, Hawaii (Earth Tech, Inc., Nov 2007)

Preliminary Phase I Dam Safety Inspection Investigation of Ka Loko Reservoir A Post-Breach Study Kauai, Hawaii

Prepared for

State of Hawaii
Department of Land and Natural Resources
Engineering Division
Kalanimoku Building
Honolulu, Hawaii 96813

Prepared by

Earth Tech, Inc.
841 Bishop Street, Suite 500
Honolulu, Hawaii 96813-3920

November 2007

Earth Tech
A Tyco International Ltd. Company

OVERVIEW

Earth Tech, Inc. (Earth Tech) has prepared this preliminary dam safety document related to a field investigation and site study that was performed in October 2006 at the site of the Ka Loko Reservoir dam. The dam was breached in the morning of March 14, 2006 sending a large volume of stored water down into the valley below.

The intent of the field investigation and site study is to determine the general condition of the Ka Loko Reservoir and its dam structure under the existing post-breach conditions. It is also the purpose of this study to determine if additional in-depth work is necessary to examine the various components of the reservoir and its dam structure in order to identify the level of safety of the entire system. The study was based on visual field observation and was performed in two consecutive phases: geological site survey and data analysis, and report writing.

During the geological survey phase, the geologic formation, visual evaluation of the embankment slope, slope stability considerations, seepage through the embankment and the natural lava flow, drainage conditions, and the existing erosion channels were investigated to identify a) the present safety status and condition of the dam structure; b) and to determine if a detailed dam safety study is necessary.

The results of the study indicate that at the time of field investigation for this work, the Ka Loko reservoir dam structure appeared stable under a low reservoir water level. A monitoring program should be established to observe and maintain a low level of water in the reservoir especially during the upcoming rainfall season. Under no circumstances should the reservoir water be allowed to flow through the breached section of the dam in large quantities. Further erosion of the weathered rock foundation in this area may increase the potential for destabilization of the embankment structure.

In addition, we recommend a follow up Phase II study to determine the current physical integrity of the reservoir and the dam system at Ka Loko Reservoir. The phase II study shall recommend as a minimum the future structural needs and shall identify any potential threats to the areas around and downstream of the dam and reservoir. Such detailed study would review in adequate detail the sub-surface condition of the remaining side embankments structure for stability. Furthermore, the study shall include a hydrologic and hydraulic assessment of the reservoir and its contributory sources of inflow. A topographic survey and geotechnical evaluation of the dam structure and the reservoir shall be performed to support the study efforts.

CONTENTS

1. INTRODUCTION

Ka Loko Dam is an earthen water storage dam on the island of Kauai constructed around 1890 by an irrigation company. It is located at an elevation of about 747 on the north side of the island, with the coordinates at 22°10'55"N Latitude, 159°22'56"W Longitude. Under normal operating conditions, water from this reservoir flows down to Waiakaiua Reservoir, Waiakaiua stream, and down to the ocean (From Wikipedia encyclopedia, http://en.wikipedia.org/wiki/ka_loko_reservoir).

The reservoir has a rated capacity of approximately 390 million gallons (MG) of water (Kilauea Agricultural Water Management Study Report, page D-2, table D-1, U.S. Department of Agriculture, dated June 1984) fed primarily through Ka Loko ditch, a man-made channel, approximately 5 miles long. The water diverted from Moloaa and Puu Ka Ele streams flows down Ka Loko Ditch for storage in Ka Loko Reservoir.

On March 14, 2006 after days of heavy rainfall, the dam failed disastrously due to a breach at its embankment near the right abutment. A large quantity of water estimated to be between 20 to 70 feet high and about 200 feet wide (From Wikipedia encyclopedia, http://en.wikipedia.org/wiki/ka_loko_reservoir) raced downhill along Wailapa Stream corridor on the north shore of Kauai. It devastated the forested area down its path, destroyed several homes, and created a number of fatalities as it rushed down towards the ocean.

Concerned about the safety of the existing condition of the dam after the breach, State Department of Land and Natural Resources (DLNR) commissioned Earth Tech, Inc (Earth Tech) to perform a phase I post breach Dam Safety investigation and a preliminary assessment of the dam condition. A field investigation took place on October 10, 2006 with this report summarizing the results of the field assessment.

1.1. PURPOSE

The purpose of this investigation is to determine the general condition of the Ka Loko Reservoir and the dam structure under the existing post-breach conditions. It is also the purpose of this work to determine if additional in-depth examination of various components of the reservoir and dam system would be necessary in order to determine the level of safety of the dam.

1.2. SCOPE

The scope of this investigation included a field assessment of the Ka Loko Dam and reservoir along with a written report encompassing the results of the field investigation and the available documents.

The field investigation was limited to visual observation and aproximate field measurements. The information on the physical characteristics of the reservoir and the water supply components have been taken from the available sources and documents.

2. GENERAL DESCRIPTION OF KA LOKO DAM

2.1. GENERAL

The Ka Loko Reservoir was initially used to store water for irrigation purposes by C. Brewer & Co. sugar plantation in Kilauea. The reservoir is presently owned by two parties, James Pflueger and the Mary N. Lucas Trust. The Dam Federal Inventory Identification Number is HI0030.

2.2. LOCATION

The Ka Loko Dam is located on the north shore of Kauai, Hawaii, approximately 10,000 feet south of Kuhio Highway. It has the coordinates 22°10'55"N Latitude and 159°22'56"W Longitude. See Figure 2-1.

2.3. ACCESS

The Ka Loko Reservoir is accessed through an approximately 13,000 foot long unimproved dirt road south of Kuhio Highway. The dirt road begins at Kuhio Highway near Wahiawa.

2.4. SITE DESCRIPTION

2.4.1. TOPOGRAPHY

Site topography is mountainous and sloping. Elevations vary from about 290 feet near Kuhio Highway to about 747 feet above sea level at the reservoir.

2.4.2. GROUND COVER

The predominant vegetation in the area consists of hao, guava, and palm trees mostly in dense growth along the downstream face of the embankment. Large trees are present throughout the perimeter of the reservoir.

2.4.3. LAND USE

Land use at the reservoir is agricultural.

2.4.4. SEISMIC ACTIVITY

The Ka Loko Reservoir is located within seismic activity zone 1 for Island of Kauai. See Figure 2-2 Records for earthquake analysis for this reservoir could not be found.

2.4.5. CLIMATE

Precipitation on the upper mountain slopes is generally due to moist northwesterly trade-winds cooling as it rises over the mountain ridges. There is a rainfall station at the reservoir site, with average annual rainfall at 85 inches, which is similar to the average (83 inches) of other five stations within 3.5 miles. The maximum annual rainfall is 146 inches (year 1956), and maximum daily rainfall is 22.4 inches (Jan 25, 1956).

2.4.6. HYDROLOGY

The reservoir is located at a high elevation on the mountainside. The water for the reservoir is supplied by means of Ka Loko Ditch, an approximately 5 mile long man-made earthen channel, from Puu Ka Ele and Moloaa streams. The average inflow rate behind the dam from Ka Loko Ditch (Puu Ka Ele and Moloaa basins via Ka Loko Ditch) is about 3.39 million gallons per day (MGD) (Irrigation System Plan For the Kilauea Agricultural Subdivisions (Draft) , by Belt Collins & Associates, Ltd. Honolulu, Hawaii, Table 3, dated February 23, 1977) with 0.22 MGD from other sources directly to Ka Loko Reservoir totaling about 3.61 MGD for Ka Loko Reservoir system.

2.4.7. WATERSHED

Ka Loko Reservoir receives its water from two separate state owned watersheds Papaa basin to the south west and Moloaa basins along the south east of the reservoir in an area known as Moloaa Forest Reserve. Water from these two areas flows down through water diversions from Moloaa and Puu Ka Ele streams via the Ka Loko Ditch into the reservoir. See Figure 2 3

2.5. DAM DESCRIPTION

2.5.1. GENERAL

Ka Loko Reservoir dam is an earthen dam with an earth-fill embankment. The data on the original design documents and construction techniques were not available. In terms of local elevation, Ka Loko dam is the highest storage dam in the Kilauea region. The water-flow through the inlet is controlled along Ka Loko Ditch, most likely at the gauging station some distance above the reservoir. The outlet works is controlled through a large pipe. The emergency spillway could not be found.

2.5.2. SIZE AND CAPACITY

Ka Loko Reservoir is located on approximately 43 acres of land. The original reservoir capacity at the level of the spillway has been reported at about 415 MG.

2.5.3. EMBANKMENT

The embankment for Ka Loko Reservoir dam is of earthen construction. Records for design and construction of the embankment were not available. However fill material was used to construct the embankment on medium to highly weathered lava flow foundation. The dam embankment was breached during a heavy rainfall season on March 14, 2006. The Ka Loko Dam breached section is shown in Photo 1 and Photo 2. The dam formation at the point of breach, from bottom to top consists of 1) saprolite and hard clay layers formed by the deep weathering of shield volcano lava flows (Waimea Canyon volcanic series); 2) medium to highly weathered lava flows of the rejuvenated stage (Koloa volcanic series); 3) reservoir deposited soft clay layers; and 4) top (crest) fill material. Photo 3 and Photo 4 both show the bottom saprolite and hard clay layers and the above medium to highly weathered lava flows at the dam breach. The highly weathered lava flows above the reservoir deposits and the top crest fill material are shown in Photo 2 and Photo 5.

2.5.4. CREST CONSTRUCTION

The reservoir sedimentation deposit layer, creating a horizontal stratum within the dam embankment (Photo 2 and Photo 6), appears similar in composition and shape to the current reservoir sediments found at the bottom of the reservoir water (Photo 7 and Photo 8). Appearance of this deposit layer suggests that the upper embankment was added some time after the reservoir deposits had been formed in an area close to the original dam crest. The upper embankment was constructed directly over the reservoir deposit layers. The pinch-out or truncation plane of the reservoir deposits, namely the original upstream dam embankment, indicates the original crest location, which is lower and down stream of the current crest. See Photo 9 and Photo 10. Note the unique and different color of the current crest fill material and the young and small trees on the upstream of the current crest with old and larger trees on the downstream of the original crest. See Photo 9 and Photo 11. This arrangement appears consistent with the notion that the current crest was added to Ka Loko reservoir at a later time. The reservoir deposits with fine silt and clay sediments generally exhibit certain shrinkage and expansion capabilities (Photo 6 and Photo 7). Presence of such sediment layer could potentially impact the stability of the current embankment and crest structure at high reservoir water levels.

Our preliminary research could not uncover the exact time and reason for constructing the upper extension to the original embankment. In general, such extensions to the height of an earthen dam embankment are meant to increase the water storage capacity of the reservoir. Considering that Ka Loko Dam structure was breached over a year ago, on March 2006, and that there is little known of the post-breached condition of the dam, we recommend that an in-depth investigation of the reservoir system be conducted. Such study should produce data in sufficient details with which the safety status of the existing embankment and the reservoir system could reasonably be validated. Until such data becomes available, we recommend that the reservoir water level should be kept at the lowest level possible, preferably below the elevation of the breached embankment opening. When water is allowed to run through the breached embankment section, a monitoring program will

be required to assure that the out-flow rate is kept very low. This may be achieved through a careful control of the amount of in-flow water coming into the reservoir from the Ka Loko Ditch system.

2.6. Dam Breach

The current crest was likely breached by water over-topping the earthen embankment. The on-site evidence suggests that the over-topping of the dam crest caused formation of a large erosion sinkhole on the embankment at the Hanalei side of the breached opening. See Photo 11 and Photo 12. This sinkhole was likely formed by a rapid erosion of the embankment soil driven by rushing water. Through visual inspection, the breached section of the dam was probably the lowest section around the perimeter of the reservoir. As water over-topped the lowest point on the crest, the breached section, severe erosion of the embankment promoted development of large erosion sink-holes similar to that shown in Photo 12. As the sink-holes became larger, the dam was breached. The high water level in the reservoir was rapidly drawn down through the breached zone, resulting in extensive flooding down stream.

2.7. Flood Channel

High water marks and extensive erosion were observed in the flood channel of Ka Loko Dam breach. See Photo 13. Similar to the lower section of the breached embankment at Ka Loko Dam, the geological formation of the flood channel consists of saprolites and hard clay layers formed by the deep weathering of shield volcano lava flows (Waimea Canyon volcanic series) and upper medium to highly weathered lava flows of the rejuvenated stage (Koloa volcanic series). See Photo 14. The flood water level marked by rock impact on tree trunks and loss of bark from remaining trees hints to a high water level after the breach. Refer to Photo 15.

2.8. Emergency Spillway

The breached section of the dam had been likely the lowest location on the dam crest along the perimeter of Ka Loko Reservoir. A report by the United States Department of Agriculture titled, "Kilauea Agricultural Water Management Study Report", Appendix D, page D-7, refers to the Ka Loko Dam spillway as, " the emergency spillway, an uncontrolled concrete section, is in good condition." Another document identifies the elevation of the spillway at 733 feet. During our field investigation, we could not locate the emergency spillway as described above.

2.9. Seepage

Minor seepage was observed at the dam breach. See Photo 16 and Photo 17. Seepage water mostly comes out from the weathered lava flows and along the top of the hard clay layers. Refer to Photo 17 and Photo 18. At the current low water level, seepage poses very little threat to the safety of the current dam.

2.10. Slumping

The floodwater created an overhang at the dam breach (Photo 17). The roof of the overhang shows signs of slumping (Photo 19). Continuous slumping will decrease the stability of the dam.

3. DISCUSSION AND CONCLUSIONS

3.1. DISCUSSION

Studying the embankment cross section of Ka Loko Reservoir dam, one could recognize that the dam structure is made up of various geologic and manmade strata. This layering and the manner of its composition suggests certain clues to the question of dam stability and safety.

As mentioned previously, a review of the dam at the cross sectional area of its breach section suggests that the dam embankment was originally constructed below the existing crest elevation. The embankment was later raised to the existing crest elevation. This is signified by presence of a relatively thick layer or stratum of the reservoir sediments. See Photo 2 and Photo 6. The reservoir sediment deposits in these photographs are shown to be situated in between the original embankment fill material and the fill placed during a later modification of the dam to increase the embankment heights to the present levels. Such sediment layers are generally composed of highly fine particles of silts and clayey soils. Presence of such soil deposits may entail fluctuations in the volume of the layer with an increase or decrease in the moisture content of the soil, thus creating a weak plane between the original embankment and the one constructed at a later time.

In addition to forming a weak base for any embankment structure, the deposit layer could, in some instances, develop large internal fissures that are normally associated with desiccation of soft sediments. Such fissures and discontinuities could generally promote seepage, thus increasing the potentials for piping action within the dam embankment.

With the low reservoir water level observed at the time of this field investigation, Ka Loko Reservoir dam, although already breached, appeared relatively stable. The breached section of the dam located at the lowest point of the dam perimeter now performs a function similar to that of a temporary emergency spillway. The immediate concern is a rise in the reservoir water elevation which could affect the underlying sediment stratum within the embankment structure, especially in the areas of the embankment with potential for new failures. Further field investigation is necessary in order to determine the constraints and parameters that could affect the dam safety for this water storage reservoir.

In addition, a rise in the reservoir water level could prompt an over-topping of the already breached section of the dam. This condition is likely to cause collapse of the natural rock foundation at the point of the existing breach followed by further flooding downstream of the reservoir. The ground formation at the breached section consists of the top reservoir deposits which can be easily eroded away to deepen and widen the breach cavity and potentially causing more flooding. Below the reservoir deposits are highly weathered lava flows, which can be eroded away by prolonged or torrent water flows.

3.2. CONCLUSIONS

Although the Ka Loko Reservoir dam appears to be stable at this time, a better knowledge of the dam structure is essential before a rational decision could be made about its stability and safety. It is clear that the dam water elevation should be maintained at the lowest level possible. This would reduce the potential for further damages to its structural integrity in case there are other deficiencies that are not yet quite understood with this preliminary study. Another reason for maintaining a low water level in the reservoir is lack of a well defined emergency spillway, which normally safeguards the safety of the dam operation against accidental surcharges beyond its storage capacity. At the present, any additional inflow of water will cause filling of the reservoir to the level of the breached point beyond which excess water would discharge through the breached section of the embankment and onto the stream below. As mentioned previously, this condition should be avoided for the reason that it could promote further disruption of the dam structure not only at the breached section through erosion and collapse of the remaining dam foundation, but also throughout the length of the embankment by increasing the moisture content in the underlying weak sediment layer that appears to be present. Thus, increasing the potential for destabilization of the embankment and piping failure.

It is our opinion that an additional in-depth study and discussions regarding the stability of the Ka Loko Reservoir dam structure is necessary before any reasonable professional judgment can be made. We recommend that the topographic survey of the embankment and the reservoir should be performed to provide the vital information on configuration and shape of the dam. The photographic data should include the entire perimeter, embankment and the breached section, the waterways upstream and downstream, and water levels in the reservoir.

Also, equally critical is information on subsurface characteristics of the embankment and its foundation materials. A slope stability analysis should be performed to gauge the existing embankment structure and the effects of the sediment layer that has become a part of it. It would also be useful to determine the extent of seepage and pore water pressures through the embankment. Another important consideration should be given to the effects of deep rooted trees and the consequences of such overgrowth on the structural stability of the embankment.

A hydrologic and hydraulic analysis should be performed to determine limits by which the dam could operate safely and to provide recommendations on a temporary or permanent emergency spillway that is the most essential component of any storage dam. Finally the inlet and outlet works must be assessed as part of the dam safety evaluation.

Prepared by:

Ardalan R. Nikou, P.E., R.M.E.
Principal Civil Engineer

Attachment D

December 6, 2007 Earth Tech Kaloko Dam Access Request letter

EarthTech
A tyco International Ltd. Company

841 Bishop Street
Suite 500
Honolulu, HI 96813

P 808.523.8874
F 808.523.8950
www.earthtech.com

December 6, 2007

William J. Wynhoff, Esq.
Deputy Attorney General
465 King Street, Suite 300
Honolulu, Hawaii 96813

Subject: Request Access to Ka Loko Reservoir and Dam

Dear Mr. Wynhoff:

We write asking you to forward our request for access to Ka Loko dam to conduct an in-depth investigation to assess the condition of the current dam and reservoir. The following is an overview of what will occur.

An initial safety inspection and study of the dam and the reservoir was performed during the month of October 2006. The purpose of this investigation was to conduct a phase I dam safety investigation assessing whether the structural and operational aspects of the dam and its component parts were functioning safely. A safety report titled "Preliminary Phase I Dam Safety Inspection, Investigation of Ka Loko Reservoir, A Post-Breach Study, Kauai, Hawaii" was produced as a result of the field investigation. The report recommended that a follow up in-depth investigation, a phase II study, was necessary to address various safety issues related to a failed dam structure.

A phase II study will require examination of soil type, stability risks related to the remaining dam embankment and its foundation through careful drilling and soil sampling, study of geology, site survey to determine the topographical features of the reservoir and the embankment structure, seepage points, study of area hydrology and hydraulics of the run-off water and the remaining reservoir, examination of the water channels that transport water to the reservoir, assessment of the inlet and outlet works, and other factors that might pose risks to the remaining structure. The investigation will likely include the following:

a) Visual investigation (walk) of the reservoir, upstream face of embankment, crest, abutments, downstream slope, outlet works, toe, drainage ditches transporting water to the reservoir, and any drains.
b) Minimal probe of the surface to assess stability of the surface. Probe would be with either a walking stick or screw driver.

c) Feel and touch various soil types to assess material. Drilling two exploratory borings to determine the subsurface soil conditions and to obtain soil samples for laboratory testing and analysis. Borings will be on the crest and the toe of the reservoir on the Lihue side of the breach.
d) Pick up loose dirt or rocks for samples.
e) Perform topographic survey of the dam embankment and around the reservoir. The survey data will be used to analyze the global and the local stability of the existing dam embankment. Some hand clearing of the site will be required for the purpose of access and line of site.
f) Measure flow rates of water at various points throughout the system using a manual flow meter or other simpler methods including detailing pertinent information on the inflow ditches.
g) Take water samples to view clarity.
h) Investigate any signs of seepage or leaks through the dam.
i) Take distance measurements.
j) Take GPS readings to locate various features.
k) Take more detailed depth measurements of water within the reservoir.
l) Take photographs.

Individuals who would go on the property would be:

a) Eric Hirano, (DLNR Chief engineer)
b) Edwin Matsuda, (DLNR engineer)
c) Denise Manuel, (DLNR engineer)
d) John Dawley, (DLNR engineer)
e) Kristen Akamine (DLNR engineering technician)
f) Ardalan Nikou (Earth Tech, engineer)
g) Dr. Yucheng Pan (Earth Tech, chief geologist)
h) Jennifer Lutz (Earth Tech, hydraulics engineer)
i) Charlotte Doss (Earth Tech, field geologist)
j) Benjamin Brooks (PGF, Lidar specialist)
k) Ernest Hirata (Hirata & Associates, project manager)
l) Rick Yoshida (Hirata & Associates, project engineer)
m) Jennifer Hirata (Hirata & Associates, Assistant project engineer)
n) David Duke (Hirata & Associates, field engineering technician)
o) Craig Lumanlan (Hirata & Associates, field engineering technician)
p) Anthony Frey (Hirata & Associates, Assistant engineering technician)
q) Owen Adams (Hirata & Associates, field drilling supervisor)
r) Jason Kapololu (Hirata & Associates, driller)
s) Sipi Siliga (Hirata & Associates, driller)
t) Elmo Sinclair (Hirata & Associates, driller's help)
u) Richard Pasco (Hirata & Associates, driller's help)
v) Ryan Mark Suzuki (RM Towill, chief surveyor)
w) Robert Martin Gabriel (RM Towill, surveyor)
x) Amador Godoy (RM Towill, surveyor)

y) Mario Layugan (RM Towill, surveyor)
z) Daniel Miranda (RM Towill, surveyor)
aa) Medardo Rocimo (RM Towill, surveyor)
bb) Benjamin Valdez (RM Towill, surveyor)

In addition to the above, as required and dependant on schedules, any of the following individuals from DLNR's Forestry and Wildlife Division may assist as drivers:

cc) Alvin Kiyono
dd) Kawika Smith
ee) Sherri Paul
ff) Alan Silva
gg) Craig Koga
hh) Galen Kawakami

We plan to accomplish the investigation in three phases and offer the following schedule:

a) Topographic Survey – Anticipate 5 days
    1) December 17-21,2007;
    2) or January 7-11, 2008;
    3) or January 14-18, 2008.
b) Geotechnical Investigations – Anticipate 15 days
    1) January 7-22, 2008;
    2) or February 19, 2008 to March 5, 2008.
c) Engineering Investigation – Anticipate 5 days
    1) Anytime between January 9–31, 2008 (Monday – Friday).

The geotechnical investigation will require the following equipment for drilling and subsurface sampling:

a) Mobile B40-L12 drill rig,
b) Skid mounted or portable drilling equipment,
c) Flatbed truck,
d) Pickup truck,
e) Chain saw and machetes.

As indicated above, assessing the in-flows into the reservoir will also be necessary. The following individuals from DLNR's Commission on Water Resource Management will attempt to locate the Moloaa Stream diversion and document its existence:

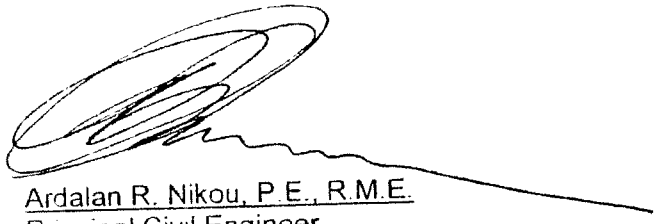
ii) Ken Kawahara (DLNR deputy)
jj) Edwin Sakoda (DLNR hydrology manager)

kk) Dean Uyeno (DLNR hydrologist)
ll) Chui Ling Cheng (DLNR hydrologist)
mm) Elise Leroux (DLNR geologist)

We would like to begin the assessment as soon as possible and within the time frame described above. Please let us know if we have your consent to enter the property. A response by Friday, December 14, 2007, would be greatly appreciated so that travel arrangements can be coordinated.

Very truly yours,

Earth Tech, Inc.



Ardalan R. Nikou, P.E., R.M.E.
Principal Civil Engineer

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WRITER'S E-MAIL
bill.j.wynhoff@hawaii.gov

December 6, 2007

William C. McCorriston, Esq.
5 Waterfront Plaza, 4th Fl.
500 Ala Moana Blvd.
Honolulu, Hawai'i 96813

Harvey E. Henderson, Jr., Esq.
Henderson Gallagher & Kane
Topa Financial Ctr, Fort St. Twr.
745 Fort St., Suite 1550
Honolulu, Hawai'i 96813

RE: Kaloko Dam and Reservoir

Dear Mr. McCorriston and Mr. Henderson:

As you will recall, DLNR and its consultants conducted a phase I study of the Kaloko Dam and Reservoir last year. The report of that study will be finalized in the near future. We will send you a copy when it is.

In the meantime, DLNR and its consultants would like to proceed with the phase II study of the dam. I enclose a letter from Ardalan Nikou of Earth Tech detailing the type of information that you requested in connection with the phase I study.

Please let me know at your earliest convenience, and in any event no later than December 12, 2007, whether your clients consent to and will assist with entry on to the dam and reservoir properties as requested.

Nothing in this letter or the study is intended to and does vary, lessen, increase, or waive anyone's duties, responsibilities, or rights under Haw. Rev. Stat. chapter 179D or otherwise.

Thank you for your attention to this matter.

263418_2.DOC

Very truly yours,

William J. Wynhoff
Deputy Attorney General

WJW:w
Enclosure
cc: Michael Gibson, Esq. (w/encl)

Attachment E

3rd Supplemental Proclamation from Governor's Emergency Proclamation, March 2, 2006

OFFICE OF THE GOVERNOR
STATE OF HAWAII

3rd SUPPLEMENTARY PROCLAMATION

By the authority vested in me as Governor by the Constitution and laws of the State of Hawaii, in order to provide relief for disaster damages, losses, and suffering, and to protect the health, safety, and welfare of the people, I, LINDA LINGLE, Governor of the State of Hawaii, hereby determine, designate and proclaim as follows:

WHEREAS, it has become necessary to supplement my proclamation of March 2, 2006, relating to the periods of heavy rains and flooding beginning Monday, February 20, 2006 through Friday, February 24, 2006, which caused localized flooding and lingering saturated ground conditions, and relating to periods of heavy rains and flooding beginning Wednesday, March 1, 2006 through Friday, March 3, 2006, which also caused localized flooding and lingering saturated ground conditions and extensive damage to private and public property in the counties of Kauai, Maui and the City and County of Honolulu, State of Hawaii, and to supplement my proclamation of March 12, 2006, relating to periods of heavy rains and flooding beginning Wednesday, March 8, 2006 through Sunday, March 12, 2006, which caused further localized flooding, saturated ground conditions, and damage to private and public property in the counties of Hawaii, Kauai, Maui, and the City and County of Honolulu, State of Hawaii, and to supplement my proclamation of March 14, 2006 relating to heavy rains and flooding beginning Monday, March 13, 2006 through Sunday, March 19, 2006, which have caused, and is causing further localized flooding, saturated ground conditions, and damage to private and public property in the counties of Hawaii, Kauai, Maui, and the City and County of Honolulu; and

WHEREAS, the National Weather Service has forecast continuing periods of heavy rains and flooding through Sunday, March 26, 2006, which are anticipated to cause further localized flooding, saturated ground conditions, and damage to private and public property in the counties of Hawaii, Kauai, Maui, and the City and County of Honolulu, State of Hawaii; and

WHEREAS, additional victims and properties damaged as a result of these continued

periods of heavy rains and flooding have been identified and are anticipated as a result of the forecast periods of heavy rains and flooding in the counties of Hawaii, Kauai, Maui, and the City and County of Honolulu, State of Hawaii; and

WHEREAS, in order to provide additional relief and assistance, it has become necessary to supplement my Proclamations of March 2, 2006, March 12, 2006, and March 14, 2006 to include these additional periods of heavy rains and flooding; and

WHEREAS, the periods of heavy rains and flooding have caused and is causing increased water levels in reservoirs in the State of Hawaii, which has lead to the failure of at least one dam on Kauai resulting in a tragic loss of life and property, erosion, and fear of dam failure in other reservoirs which may lead to further loss of life and property; and

WHEREAS, pursuant to Section 128-8(2), Hawaii Revised Statutes, the Governor, in the event of a civil defense emergency period, may designate as public nuisances acts, practices, conduct, or conditions which are dangerous to the public health or safety or to property; and

WHEREAS, pursuant to Section 128-8(2), Hawaii Revised Statutes, the Governor, in the event of a civil defense emergency period, may authorize that public nuisances be summarily abated, and if need be that the property be destroyed, by any police officer or any authorized person; and

WHEREAS, pursuant to Section 128-6(8), Hawaii Revised Statutes, the Governor may direct or control as may be necessary for civil defense the conduct of civilians and the movement and cessation of movement of pedestrians and vehicular traffic during, before, and after any disaster; and

WHEREAS, pursuant to Section 128-6(8), Hawaii Revised Statutes, the Governor may direct or control as may be necessary for civil defense traffic control; and

WHEREAS, pursuant to Section 128-6(8), Hawaii Revised Statutes, the Governor may

direct or control as may be necessary for civil defense the congregation of the public in stricken or danger areas or under dangerous conditions; and

WHEREAS, pursuant to Section 128-6(8), Hawaii Revised Statutes, the Governor may direct or control as may be necessary for civil defense the evacuation and reception of the civilian population; and

WHEREAS, pursuant to section 128-10(5), Hawaii Revised Statutes, the Governor is further authorized to order and direct government agencies, officers, and employees, state or local, to take such action and employ such measures for law enforcement, medical, health, fire fighting, traffic control, warnings, and signals, engineering, rescue, construction, emergency housing, and other welfare, hospitalization, transportation, water supply, public information, training, and other civil defense and emergency functions as may be necessary, and utilize the services, materials, and facilities of the agencies and officers; and

NOW, THEREFORE, I, LINDA LINGLE, Governor of the State of Hawaii, hereby determine that a major disaster and catastrophe contemplated by sections 127-11, 121-30, 209-2, 128-8(4), 128-9(8), 128-10(5), 128-10(10), 128-10(11), 128-10(15), and parts II and III of chapter 209, Hawaii Revised Statutes, has occurred during the above periods in the counties of Hawaii, Kauai, Maui and the City and County of Honolulu, State of Hawaii, and in order to provide additional relief and assistance, do hereby supplement my Proclamations of March 2, 2006, March 12, 2006, and March 14, 2006 to include the period of heavy rains and flooding beginning March 14, 2006 and forecast to continue through Sunday, March 26, 2006, in the counties of Hawaii, Kauai, Maui, and the City and County of Honolulu, State of Hawaii for the purpose of authorizing the expenditure of State moneys, as appropriated, for the speedy and efficient relief of the damages, losses, and suffering resulting from the disaster.

FURTHER, pursuant to Sections 128-6(8) and 128-10(5), Hawaii Revised Statutes, as may be necessary for civil defense, I direct State and County civil defense authorities, and all State and County agencies, officers, and employees that may be directed thereby to assist, to take appropriate measures to protect the health and safety of the public by directing and controlling

vehicular traffic during, before, and after any disaster; traffic; the congregation of the public in stricken or danger areas or under dangerous conditions; the evacuation and reception of the civilian population.

FURTHER, pursuant to Section 128-8(2), Hawaii Revised Statutes, I continue to find that the dangerous conditions of certain reservoirs in the State of Hawaii and erosion, and fear of dam failure in certain reservoirs constitute a public nuisance which are dangerous to the public health or safety or to property and hereby authorize the Director of Civil Defense or the Vice Director of Civil Defense to direct that any public nuisances be summarily abated, and if need be that the property be destroyed, by any police officer or any authorized person in order to protect the public health and safety.

FURTHER, all provisions and requirements of my Proclamations of March 2, 2006, March 12, 2006, and March 14, 2006 remain in full force and effect and are made applicable for this Supplementary Proclamation.

Done at the State Capitol State of Hawaii, this 18 day of March, 2006.

LINDA LINGLE
Governor of Hawaii

APPROVED:

LISA M. GINOZA
First Deputy Attorney General
State of Hawaii